

HOLBROOK WATER SYSTEM (PWS 6360004) SOURCE WATER ASSESSMENT FINAL REPORT

May 28, 2002



State of Idaho Department of Environmental Quality

Disclaimer: This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for Holbrook Water System, Holbrook, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the public water system (PWS).**

The Holbrook Water System (PWS #6360004) consists of one well source. The well is located on the east side of the community and currently serves 25 persons through 14 connections.

The potential contaminant sources within the delineation capture zones include the Deep Creek, Sheep Creek, Arbon Valley Road, and Highway 37. If an accidental spill occurred from any of these corridors, inorganic chemical contaminants, volatile organic chemical contaminants, synthetic organic chemical contaminants, or microbial contaminants could be added to the aquifer system. A complete list of potential contaminant sources is provided with this assessment (Table 1).

For the assessment, a review of laboratory tests was conducted using the Idaho Drinking Water Information Management System (DWIMS) and the State Drinking Water Information System (SDWIS). Total coliform bacteria were detected at various locations in the distribution system. However, the last detection of total coliform bacteria in the distribution system was October 1999. The inorganic chemicals arsenic, barium, cadmium, chromium, fluoride, mercury, nitrate, selenium, and sodium have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Arsenic has been detected at 11 µg/L (October 1989), but has not been detected since. No volatile organic chemicals or synthetic organic chemicals have been detected in the drinking water.

Final susceptibility scores for the Holbrook Water System were derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, the Holbrook well rated high for IOCs, VOCs, SOCs, and microbials. System construction scores were moderate and hydrologic sensitivity scores were high. Potential contaminant inventory and land use scores were moderate for IOCs, VOCs, SOCs, and low for microbials.

A well log was not available for the well during the analysis. Any rating derived from information on a well log automatically defaulted to a higher score. If the well log would have been available for the well, the well's system construction and hydrologic sensitivity scores might have been lower.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Holbrook Water System, drinking water protection activities should continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. If microbial problems arise the system should take appropriate measures to treat the water source. Treatments, such as disinfectant and filtration should be investigated to remedy this problem. The system should also focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Land uses within most of the source water assessment area are outside the direct jurisdiction of Holbrook Water System. Therefore partnerships with state and local agencies, industrial, and commercial groups should be established to ensure future land uses are protective of ground water quality.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Since Highway 37 intersects the delineation, the Idaho Department of Transportation should be involved in protection efforts. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Oneida County Soil Conservation and Water District.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR HOLBROOK WATER SYSTEM, HOLBROOK, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the public water system (PWS).**

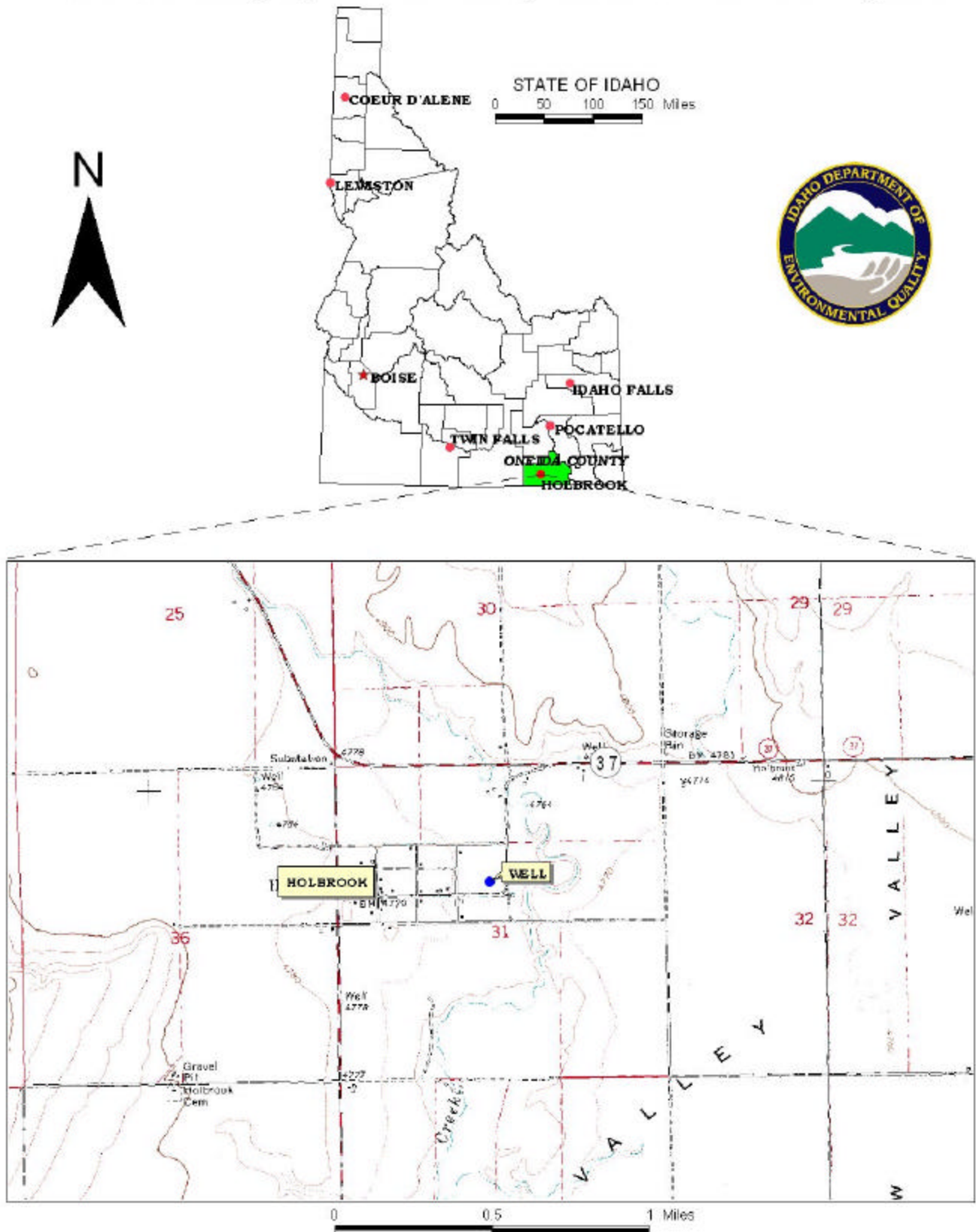
The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Holbrook Water System (PWS #6360004) is a community drinking water system located in Oneida County (Figure 1). The system consists of one well source that provides drinking water to approximately 25 persons through 14 connections.

FIGURE 1. Geographic Location of the Holbrook Water System



The inorganic chemicals (IOCs), barium, cadmium, chromium, fluoride, mercury, nitrate, selenium, and sodium represent the main water chemistry constituents recorded in the public water system, although the reported concentrations of these chemicals were below the maximum contaminant level (MCL). Total coliform bacteria were detected at various locations in the distribution system. However, the last detection of total coliform bacteria in the distribution system was October 1999. Water chemistry tests have not detected synthetic organic contaminants (SOCs) or volatile organic contaminants (VOCs) in the drinking water.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Washington Group International (WGI) was contracted by DEQ to define the public water system's zones of contribution. WGI used a conceptual computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Black Pine - Curlew Valley hydrologic province in the vicinity of the Holbrook Water System. The computer model used site specific data, assimilated by WGI from a variety of sources including operator records, well logs (when available) and hydrogeologic reports. A summary of the hydrogeologic information from the WGI is provided below.

Hydrogeologic Conceptual Model

The Black Pine – Curlew Valley hydrologic province contains 266 square miles, with 96 percent of the total area located in Oneida County and 4 percent located in Cassia County. The entire province is located within the larger Basin and Range physiographic province. It is characterized by high, steep-sided mountain ranges that trend in a north-south direction and are made up of limestone, dolomite, quartzite, and sandstone (Chapman and Young, 1972, p. 10). These Paleozoic rocks have undergone considerable structural deformation and, as a result, are complexly folded, fractured, and jointed. Faults, joints and fracture zones, bedding planes, and solution cavities in the carbonate rocks provide local channels through which rainfall and snowmelt can be absorbed and transmitted underground (Bolke and Price, 1969, p. 10). Intermontane deposits are composed of Tertiary and Quaternary lakeshore deposits, volcanics alluvium, and colluvium.

The aquifers within the Curlew Valley can be divided into two broad categories: valley fill and older consolidated rocks. The valley fill is composed of unconsolidated to semiconsolidated sediments and assorted volcanic rocks of Quaternary to Tertiary age (Baker, 1974, p. 11). The oldest of the valley-fill deposits is a thick sequence of tightly bedded, predominantly tuffaceous continental sedimentary rocks and assorted volcanic rocks of late Tertiary age. This deposit is referred to as both the Salt Lake

Formation (in Utah and Idaho) and as the Payette Formation (only in Idaho). These alluvial and lacustrine deposits and intercalated volcanic rocks form the main ground water reservoir in Curlew Valley (Bolke and Price, 1969, p. 11). The consolidated rocks of Paleozoic and Precambrian age, which form the bulk of the mountain ranges surrounding the valley, are of only slight economic importance as aquifers, although they may contribute substantial amounts of recharge to the aquifers in the valley fill (Baker, 1974, p. 11).

The maximum thickness of the valley fill is not explicitly known because the contact with the underlying Tertiary rocks is not recognized in the logs of wells that fully penetrate the valley fill (Bolke and Price, 1979, p. 11). In the Holbrook area the thickness exceeds 5,000 feet (Baker, 1974, p. 13).

Curlew Valley area is divided into two drainage basins above the town of Holbrook. The western basin is drained by Rock Creek, and the eastern arm is drained by Deep Creek (Figure 1). Below the junction with Rock Creek, the channel of Deep Creek is dry during most months.

About 3 miles south of Holbrook, a group of springs (variously called Deep Creek Springs, Big Springs, and Holbrook Springs) discharges in the channel of the creek. These springs have a steady flow of 25 to 30 cubic feet per second (Chapman and Young, 1972, p. 1). Although the springs appear in the channel of Deep Creek, the temperature and the quality of the water suggest that the source of the springs is water from the consolidated rocks of the Sublett Range rather than from valley fill (Baker, 1974, p. 35).

About 4 miles downstream from the springs, Curlew Dam impounds the water of the creek for irrigation in the Stone, Idaho-Snowville, Utah area. The southern half of Curlew Valley has undergone significant irrigation well development since 1953 (Chapman and Young, 1972, pp. 1). When Curlew Dam is full, the reservoir extends to within a few hundred feet of Holbrook Springs. Releases from the dam and ground water inflow from the valley fill make Deep Creek a perennial stream from the dam to a small impoundment about 7 miles southwest of the point where the stream crosses into Utah. The amount of water released from the dam is "small," and the water in the stream disappears into the ground within a few miles (Baker, 1974, p. 8).

From considerations of geologic and geographic features, chemical quality of water, and hydraulic head, three shallow ground water flow systems can be distinguished within the Curlew Valley. Each of these flow systems contains many interconnected beds with varying hydraulic properties, but each can be treated as a hydrologic entity (Baker, 1974, Plate 3, p. 13). These flow systems are referred to as the Kelton flow system, the Juniper-Black Pine flow system, and the Holbrook-Snowville flow system. The PWS wells in the Black Pine - Curlew Valley hydrologic province produce water from the Holbrook-Snowville flow system. The Kelton flow system is located entirely in Utah.

Recharge to the Holbrook-Snowville flow system comes primarily from precipitation on the east side of the Sublett Range, the southeast end of the Deep Creek Mountains, the west side of the Blue Springs Hills, and the west side of the North Promontory Mountains, which together bound the Holbrook arm in Idaho (Baker, 1974, p. 28). Estimated annual precipitation varies with elevation and ranges from 12 inches to more than 25 inches (Baker, 1974, Plate 1 and p. 29). Annual recharge from precipitation over the 176,700 acres that comprise the Holbrook-Snowville flow system in Idaho is 44,000 acre-feet or 3 inches (Baker, 1975, p. 29).

This value includes areal recharge on the valley floor, as well as infiltration into bedding planes and joints in the carbonate bedrock along the valley margin.

Discharge from the aquifer is by (1) spring discharge, (2) pumpage, (3) underflow to Utah, (4) seepage to Deep Creek, and (5) consumptive use by plants.

An aquifer test conducted in the Curlew Valley in 1972 provided transmissivity estimates for the valley-fill aquifer that ranged from 30,000 to 60,000 gal/day/ft using pumping well data and up to 4,260,000 gal/day/ft using observation well data (Chapman and Young, 1972, p. 37). The average transmissivity of the aquifer is believed to be approximately 150,000 to 250,000 gal/day/ft based on data collected during the pumping well test and specific capacity results (Chapman and Young, 1972, p. 37). This range is supported by a constant rate aquifer test that was conducted in 1970 a few miles north of Snowville and also by specific capacity data from a well about 4 miles south of the pumping test area. Analysis of drawdown data from this constant rate test resulted in estimates of transmissivity ranging from 149,610 to 164,571 gal/day/ft. The transmissivity estimate based on analysis of specific capacity data was 142,130 gal/day/ft (Baker, 1974, p. 30).

Ground water in the Curlew Valley is unconfined in the northern part of the valley and leaky artesian near the Idaho-Utah border (Baker, 1974, p. 28). The ground-water flow direction is generally south. The hydraulic gradient varies from approximately 100 ft/mile (0.019) in the northern end of the valley to 8 ft/mile (0.0015) toward the center of the valley (Chapman and Young, 1972, pp. 40, 44). Variations are caused by heterogeneities and local areas of recharge or discharge. The gradient flattens near Holbrook as the combined result of the aquifer having greater cross-sectional area and higher permeability. The gradient also flattens near Curlew Dam as the result of recharge to the ground water system from the dam into permeable gravels (Chapman and Young, 1972, p. 44).

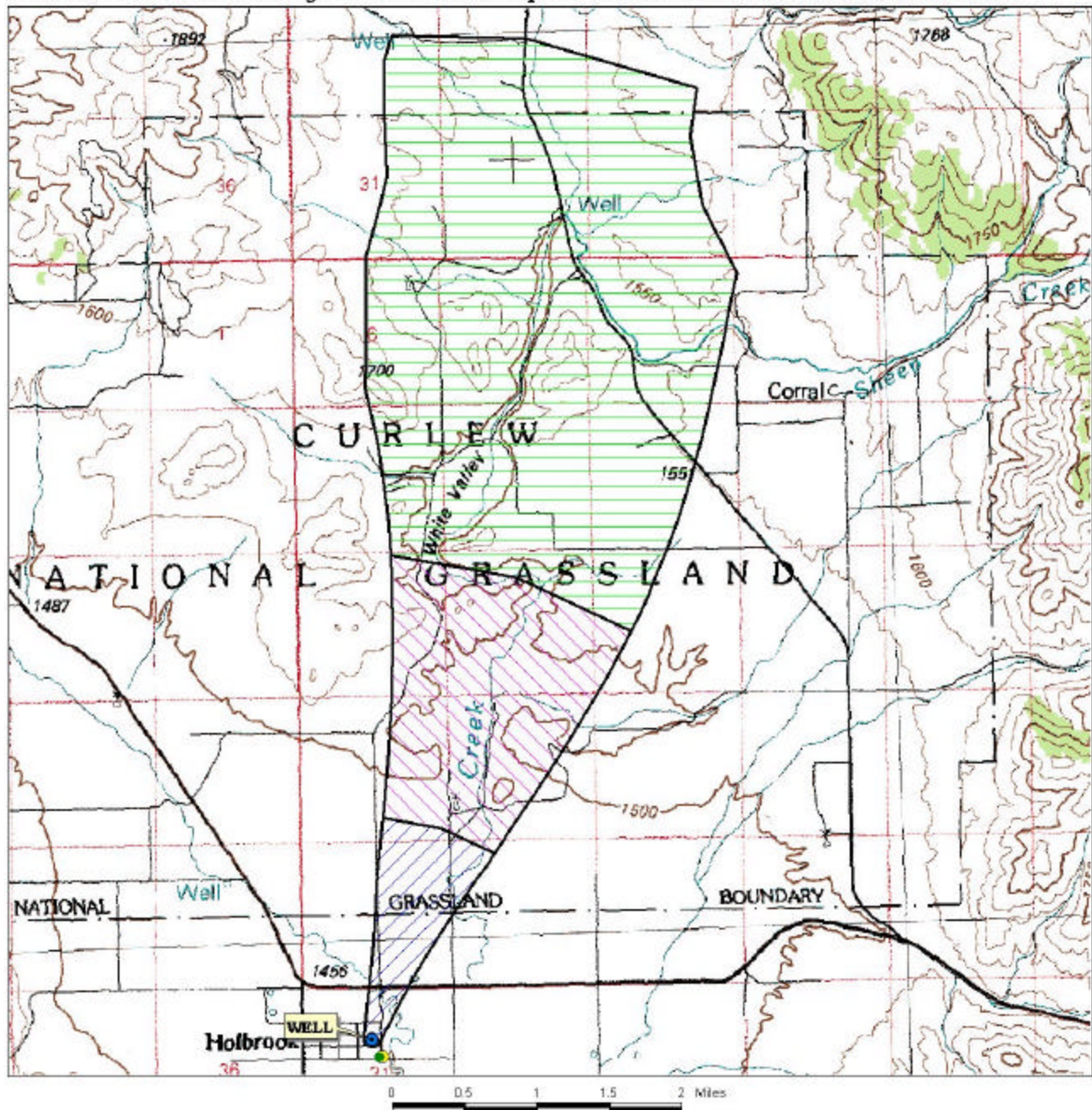
The delineated source water assessment areas for the Holbrook Water System well can best be described as a north-northeast trending wedge approximately 6 miles long and 2 miles wide (Figure 2). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified potential contaminant sources within the delineation areas. These sources include Highway 37, Deep Creek, Sheep Creek, and the Arbon Valley Road (Table 1).

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

FIGURE 2. Holbrook Water System Delineation Map and Potential Contaminant Source Locations



PWS# 6360004
WELL

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during April and May of 2002. The first phase involved identifying and documenting potential contaminant sources within the Holbrook Water System source water assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Mr. Larry Nalder. At the time of the enhanced inventory, no additional potential contaminant sources were found within the delineated source water area. Maps with well locations, delineated areas and potential contaminant sources are provided with this report (Figure 2).

Table 1. Holbrook Water System, Well #1, Potential Contaminant Inventory

Site #	Source Description	TOT Zone ¹ (years)	Source of Information	Potential Contaminants ²
	Deep Creek	0-10	GIS Map	IOC, VOC, SOC, Microbials
	Sheep Creek	6-10	GIS Map	IOC, VOC, SOC
	Highway 37	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Arbon Valley Road	6-10	GIS Map	IOC, VOC, SOC

¹ TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

² IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The susceptibility of the well to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was rated high for the well. This is based upon moderate to well drained soil classes as defined by the National Resource Conservation Service (NRCS). There was also insufficient well log information available to evaluate the vadose zone composition, the first depth to ground water, and whether there is at least 50 feet of cumulative thickness of low permeability material that could reduce the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The system construction score was rated moderate for the well. The 2000 sanitary survey states the wellhead and surface seal are maintain and in good condition. Also, there was a well vent on the well casing and the height of the wellhead is 24-inches above the well house floor. The well is located outside of the 100-year floodplain, decreasing the chance of contaminants being drawn into the drinking water source by surface water flooding. No well log information was available to determine whether the well casing and annular seal extend into a low permeable geologic formation, or if the highest production came from more than 100 feet below the static water level.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm) a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, whether the casing and annular space is within consolidated material or 18 feet below the surface, the thickness of the casing, etc. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. In this case, there was insufficient information available to determine if the well meets all the criteria outlined in the IDWR Well Construction Standards.

Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the well's susceptibility. When agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. The predominant land use within the delineated capture zones of the Holbrook Water System well is agriculture land.

In terms of potential contaminant sources and land use susceptibility the ratings are as follows. The well rated moderate for IOCs (i.e., nitrates), VOCs (i.e. petroleum related products), SOC (i.e., pesticides), and low for microbial contaminants (i.e., fecal coliform).

The potential contaminant sources found within the delineated areas include the Deep Creek, Sheep Creek, Arbon Valley Road, and Highway 37. The locations of potential contaminant sources and delineated TOT zones for the well are shown on Figure 2.

Final Susceptibility Ranking

A detection above a drinking water standard (MCL), any detection of a VOC or SOC, or having potential contaminant sources within 50 feet of the wellhead will automatically give a high susceptibility rating to the final well ranking despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and a large percentage of agricultural land contribute greatly to the overall ranking.

Table 2. Summary of Holbrook Water System Susceptibility Evaluation

Drinking Water Source	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Potential Contaminant Inventory and Land Use				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	L	M	H	H	H	H

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, the well rated high for IOCs, VOCs, SOC, and microbials. System construction score was moderate and hydrologic sensitivity score was high. Potential contaminant inventory and land use scores were moderate for IOCs, VOCs, SOC, and low for microbials.

The IOCs arsenic, barium, cadmium, chromium, fluoride, mercury, nitrate, selenium, and sodium have been detected in the well, although the reported concentrations of these chemicals were below the MCL for each chemical. No VOCs or SOC have been detected in the well.

As no well log was available for the well any rating derived from information on a well log automatically defaulted to a higher score. If the well log would have been available, system construction and hydrologic sensitivity scores for the well might have been lower.

Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Holbrook Water System, drinking water protection activities should continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. If microbial problems arise the system should take appropriate measures to treat the water source. Treatments, such as disinfectant and filtration should be investigated to remedy this problem. The system should also focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity. Land uses within most of the source water assessment area are outside the direct jurisdiction of Holbrook Water System. Therefore partnerships with state and local agencies, industrial, and commercial groups should be established to ensure future land uses are protective of ground water quality.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, and the Oneida Soil and Water Conservation District.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Pocatello Regional DEQ Office (208) 236-6160

State DEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper at (208) 343-7001 or email her at mlharper@idahoruralwater.com for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

References Cited

- Baker, C.H., Jr., 1974, Water Resources of the Curlew Valley Drainage Basin, Utah and Idaho, State of Utah, Department of Natural Resources, Technical Publication No. 45, 91 p.
- Bolke, E.L., and D. Price, 1969, Hydrologic Reconnaissance of Curlew Valley, Utah and Idaho, State of Utah, Department of Natural Resources, Technical Publication No. 25, 40 p.
- Chapman, S.L., and N.C. Young, 1972, Water Resources of Western Oneida and Southern Power Counties, Idaho, Idaho Department of Administration, Water Information Bulletin No. 25, 69 p.
- Drinking Water Information Management System (DWIMS). Idaho Department of Environmental Quality.
- Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environment Managers, 1997. "Recommended Standards for Water Works."
- Idaho Division of Environmental Quality Ground Water Program, October 1999. Idaho Source Water Assessment Plan.
- Idaho Department of Environmental Quality. 2000. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.
- Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.
- Safe Drinking Water Information System (SDWIS). Idaho Department of Environmental Quality.
- Southeastern District Health Department. 2000. Sanitary Survey of Holbrook Water System: PWS #6360004.
- Washington Group International, Inc, December 2001. Source Area Delineation Report for the Black Pine - Curlew Valley Hydrologic Province.

Attachment A

Holbrook Water System Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

1. System Construction

SCORE

Drill Date	unknown	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score VOC Score SOC Score Microbial Score

Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	2	2	2	2
(Score = # Sources X 2) 8 Points Maximum		4	4	4	4
Sources of Class II or III leacheable contaminants or	YES	2	2	2	
4 Points Maximum		2	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B 25 to 50% Non-Irrigated Agricultural Land		1	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone 1B		7	7	7	5

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II 25 to 50% Irrigated Agricultural Land		1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0

Cumulative Potential Contaminant / Land Use Score

15 15 15 7

4. Final Susceptibility Source Score	13	13	13	13
5. Final Well Ranking	High	High	High	High